

# SECTION 3

Time—30 minutes

30 Questions

**Numbers:** All numbers used are real numbers.

**Figures:** Position of points, angles, regions, etc. can be assumed to be in the order shown; and angle measures can be assumed to be positive.

Lines shown as straight can be assumed to be straight.

Figures can be assumed to lie in a plane unless otherwise indicated.

Figures that accompany questions are intended to provide information useful in answering the questions. However, unless a note states that a figure is drawn to scale, you should solve these problems NOT by estimating sizes by sight or by measurement, but by using your knowledge of mathematics (see Example 2 below).

**Directions:** Each of the Questions 1-15 consists of two quantities, one in Column A and one in Column B. You are to compare the two quantities and choose

- A if the quantity in Column A is greater;
- B if the quantity in Column B is greater;
- C if the two quantities are equal;
- D if the relationship cannot be determined from the information given.

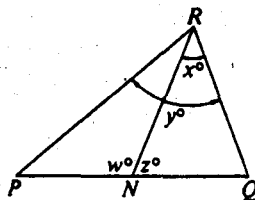
**Note:** Since there are only four choices, NEVER MARK (E).

**Common**

**Information:** In a question, information concerning one or both of the quantities to be compared is centered above the two columns. A symbol that appears in both columns represents the same thing in Column A as it does in Column B.

	Column A	Column B	Sample Answers
<b>Example 1:</b>	$2 \times 6$	$2 + 6$	<input type="radio"/> A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E

Examples 2-4 refer to  $\triangle PQR$ .



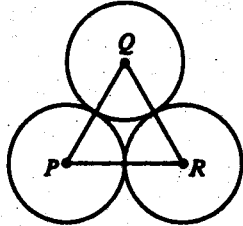
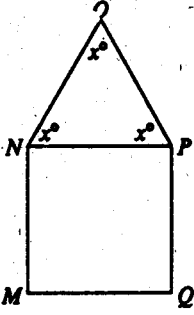
<b>Example 2:</b>	$PN$	$NQ$	<input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D <input type="radio"/> E (since equal measures cannot be assumed, even though $PN$ and $NQ$ appear equal)
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<b>Example 3:</b>	$x$	$y$	<input type="radio"/> A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E (since $N$ is between $P$ and $Q$ )
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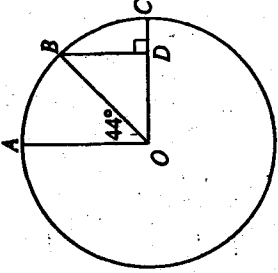
<b>Example 4:</b>	$w + z$	$180$	<input type="radio"/> A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D <input type="radio"/> E (since $PQ$ is a straight line)
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GO ON TO THE NEXT PAGE.

- A if the quantity in Column A is greater;  
 B if the quantity in Column B is greater;  
 C if the two quantities are equal;  
 D if the relationship cannot be determined from the information given.

Column A	Column B	Column A	Column B
1. $3^4$	$4^3$	$ -3  = -m$	
$x = 2y + 3$ $y = -2$		7. $m$	3
2. $x$	-1	$n$ is an even integer and a multiple of 3.	
$d = 5.03894$ and $\boxed{d}$ is the decimal expression for $d$ rounded to the nearest thousandth.		8. The remainder when $n$ is divided by 12	6
3. The number of decimal places where $d$ and $\boxed{d}$ differ	4		
$x + 2y > 8$		Equilateral triangle $PQR$ is formed by joining centers $P$ , $Q$ , and $R$ of the circles. Each pair of circles has exactly one point in common.	
4. $2x + 4y$	20	9. The perimeter of triangle $PQR$	The circumference of the circle with center $Q$
		10. The volume of a cylindrical tank that has a radius of 2 meters and a height of 10 meters	The volume of a cylindrical tank that has a radius of 1 meter and a height of 20 meters
Square $MNPQ$ has area 36.		GO ON TO THE NEXT PAGE.	
5. The perimeter of pentagon $MNOPQ$	30		
$p$ and $q$ are different prime numbers. $r$ is the least prime number greater than $p$ , and $s$ is the least prime number greater than $q$ .			
6. $r - p$	$s - q$		

- A if the quantity in Column A is greater;  
 B if the quantity in Column B is greater;  
 C if the two quantities are equal;  
 D if the relationship cannot be determined from the information given.

Column A	Column B	Column A	Column B
11. The time required to travel $d$ miles at $s$ miles per hour	The time required to travel $\frac{d}{2}$ miles at $2s$ miles per hour $ds \neq 0$	 <p><math>O</math> is the center of the circle and <math>\angle AOC</math> is a right angle.</p>	
12. The sum of the measures of the two angles of $\triangle RST$ that have equal measure	$\triangle RST$ is isosceles and $\angle RST = 40^\circ$ $120^\circ$	14.	$OD$ $BD$
13. $\sqrt{x^4 + 6x^2 + 9}$	$x^2 + 3$	15.	Julio's salary Maria's new salary
		<p>Before Maria changed jobs, her salary was 24 percent more than Julio's salary. After Maria changed jobs, her new salary was 24 percent less than her old salary.</p>	

GO ON TO THE NEXT PAGE.

**Directions:** Each of the Questions 16-30 has five answer choices. For each of these questions, select the best of the answer choices given.

16.  $(19 - 18 - 17 - 16) - (20 - 19 - 18 - 17) =$

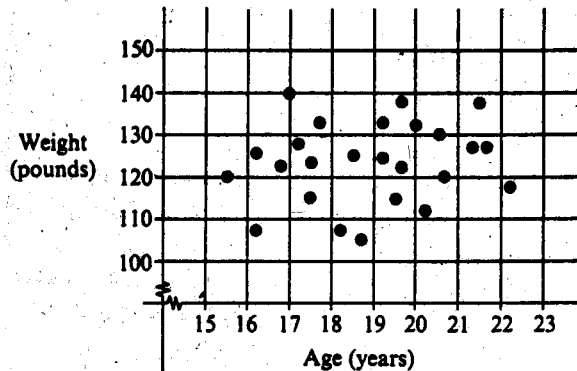
- (A) -36
- (B) -6
- (C) -4
- (D) 1
- (E) 2

17. If  $3x - 2 = 7$ , then  $4x =$

- (A) 3
- (B) 5
- (C)  $\frac{20}{3}$
- (D) 9
- (E) 12

18. Of the following, which is closest to  $\sqrt[3]{30}$ ?

- (A) 6
- (B) 5
- (C) 4
- (D) 3
- (E) 2



19. The dots on the graph above indicate age and weight for a sample of 25 students. What percent of these students are less than 19 years old and weigh more than 110 pounds?

- (A) 36%
- (B) 40%
- (C) 44%
- (D) 48%
- (E) 52%

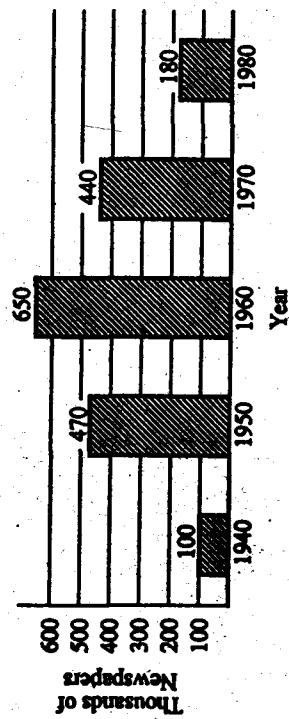
20. The greatest number of diagonals that can be drawn from one vertex of a regular 6-sided polygon is

- (A) 2
- (B) 3
- (C) 4
- (D) 5
- (E) 6

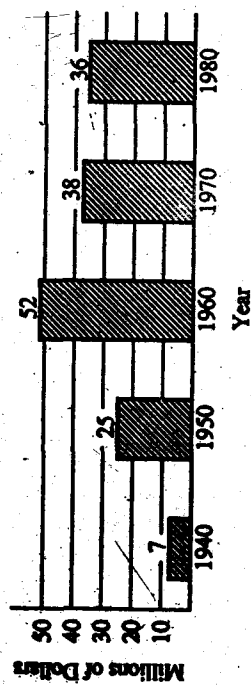
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Questions 21-25 refer to the following graphs.

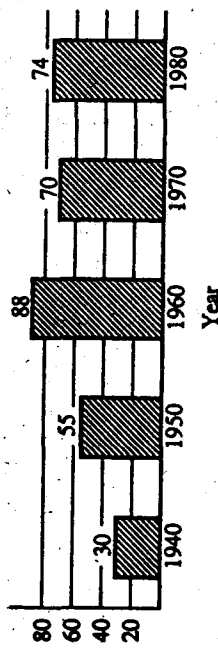
AVERAGE DAILY CIRCULATION FOR NEWSPAPER X



TOTAL YEARLY ADVERTISING REVENUE FOR NEWSPAPER X



AVERAGE NUMBER OF PAGES PER NEWSPAPER FOR NEWSPAPER X



GO ON TO THE NEXT PAGE.

21. In how many of the years shown was the average number of pages per newspaper at least twice as much as the average in 1940?

(A) Four  
(B) Three  
(C) Two  
(D) One  
(E) None

22. In 1950, if the printing cost per newspaper was \$0.05, what would have been the total cost of printing the average daily circulation?

(A) \$32,500  
(B) \$26,000  
(C) \$23,500  
(D) \$22,000  
(E) \$2,600

23. In 1980 the number of dollars of advertising revenue was how many times as great as the average daily circulation?

(A) 500  
(B) 200  
(C) 100  
(D) 50  
(E) 20

24. The percent decrease in average daily circulation from 1960 to 1970 was approximately

(A) 10%  
(B) 12%  
(C) 20%  
(D) 26%  
(E) 32%

25. Which of the following statements can be inferred from the data?

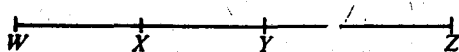
- I. The greatest increase in total yearly advertising revenue over any 10-year period shown was \$27 million.  
II. In each of the 10-year periods shown in which yearly advertising revenue decreased, average daily circulation also decreased.  
III. From 1970 to 1980 the average number of pages per newspaper increased by 10.

(A) I only  
(B) II only  
(C) III only  
(D) I and II  
(E) II and III

GO ON TO THE NEXT PAGE.

26. If  $0 < st < 1$ , then which of the following can be true?

(A)  $s < -1$  and  $t > 0$   
 (B)  $s < -1$  and  $t < -1$   
 (C)  $s > -1$  and  $t < -1$   
 (D)  $s > 1$  and  $t < -1$   
 (E)  $s > 1$  and  $t > 1$



27. On segment  $WZ$  above, if  $WY = 21$ ,  $XZ = 26$ , and  $YZ$  is twice  $WX$ , what is the value of  $XY$ ?

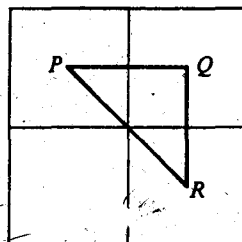
(A) 5  
 (B) 10  
 (C) 11  
 (D) 16  
 (E) It cannot be determined from the information given.

28. To reproduce an old photograph, a photographer charges  $x$  dollars to make a negative,  $\frac{3x}{5}$  dollars for each of the first 10 prints, and  $\frac{x}{5}$  dollars for each print in excess of 10 prints. If \$45 is the total charge to make a negative and 20 prints from an old photograph, what is the value of  $x$ ?

(A) 3  
 (B) 3.5  
 (C) 4  
 (D) 4.5  
 (E) 5

29. Which of the following is equal to  $\frac{1}{4}$  of 0.01 percent?

(A) 0.000025  
 (B) 0.00025  
 (C) 0.0025  
 (D) 0.025  
 (E) 0.25



30. In the figure above, each of the four squares has sides of length  $x$ . If  $\triangle PQR$  is formed by joining the centers of three of the squares, what is the perimeter of  $\triangle PQR$  in terms of  $x$ ?

(A)  $2x\sqrt{2}$   
 (B)  $\frac{x\sqrt{2}}{2} + x$   
 (C)  $2x + \sqrt{2}$   
 (D)  $x\sqrt{2} + 2$   
 (E)  $2x + x\sqrt{2}$

T1

## SECTION 7

Time—30 minutes

30 Questions

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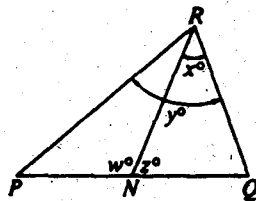
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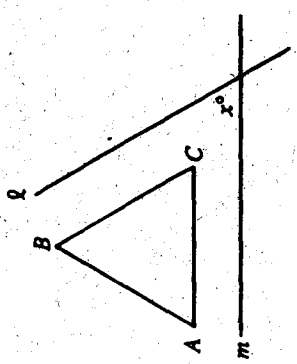
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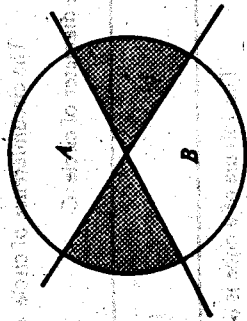
Column A	Column B
1. The number of months in 7 years	The number of days in 17 weeks
2. $1 - \frac{1}{27}$	$\frac{8}{9} + \frac{1}{81}$
 <p><math>\triangle ABC</math> is equilateral. Line <math>l</math> is parallel to side <math>BC</math> and line <math>m</math> is parallel to side <math>AC</math>.</p>	
3. $x$	60
4. $\frac{r^2}{r}$	$\frac{r^2}{s}$
$r > s > 0$	
5. The diameter of circle C	The circumference of circle C is $18\pi$ .
6. $9^7$	10,000,000
7. The area of the base of the cube	The volume of a cube is 64.
8. $s$	7
9. $(0.82)^2(0.82)^3$	$(0.82)^6$
10. $((-1)^s)^r$	$2^s$
For all real numbers $a$ , let $a^* = 1 - a$ .	

GO ON TO THE NEXT PAGE.

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Column A

Column B



The areas of the two shaded regions of the circle are equal.

11. The area of unshaded region A of the circle      The area of unshaded region B of the circle

$$x \neq 0$$

12.  $\frac{x}{|x|}$

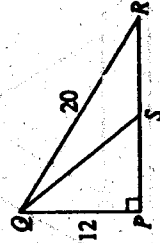
Column A

Column B

Team X scored  $p$  points more than team Y, and the two teams together scored a total of 10 points.

13. Twice the number of points team Y scored       $10 - p$

14.  $(x - 1)(x)(x + 1)$        $(x)(x)(x)$



The area of  $\triangle PQS$  is 45.

15. The length of segment PS      The length of segment SR

GO ON TO THE NEXT PAGE.

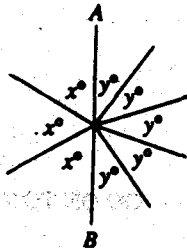
Directions: Each of the Questions 16-30 has five answer choices. For each of these questions, select the best of the answer choices given.

16. In a certain shop, notebooks that normally sell for 59 cents each are on sale at 2 for 99 cents. How much can be saved by purchasing 10 of these notebooks at the sale price?

(A) \$0.85  
(B) \$0.95  
(C) \$1.10  
(D) \$1.15  
(E) \$2.00

17. Which of the following is a solution to  $x + x^2 = 1$ ?

(A) -1  
(B) 0  
(C)  $\frac{1}{2}$   
(D) 1  
(E) None of the above

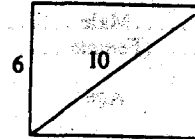


18. In the figure above,  $AB$  is a line segment. What is the value of  $\frac{x-y}{x+y}$ ?

(A)  $\frac{5}{24}$   
(B)  $\frac{1}{4}$   
(C)  $\frac{7}{16}$   
(D)  $\frac{11}{24}$   
(E)  $\frac{7}{13}$

19. If the average (arithmetic mean) of 5 consecutive integers is 12, what is the sum of the least and greatest of the 5 integers?

(A) 24  
(B) 14  
(C) 12  
(D) 11  
(E) 10



20. What is the perimeter of the rectangle shown above?

(A) 14  
(B) 24  
(C) 28  
(D) 38  
(E) 48

GO ON TO THE NEXT PAGE.

Questions 21-25 refer to the following chart.

**PROFILE OF CONGRESS IN YEAR X**  
(total membership: 535)

House of Representatives		Senate
<b>Party</b>		
292.....	Democratic .....	62
143.....	Republican.....	38
435.....	Total .....	100
<b>Sex</b>		
418.....	Male .....	100
17.....	Female .....	0
<b>Age</b>		
27.....	Youngest.....	34
77.....	Oldest.....	80
48.....	Average (arithmetic mean) .....	54
<b>Religion</b>		
255.....	Protestant .....	69
107.....	Catholic.....	12
18.....	Jewish.....	5
4.....	Mormon.....	3
51.....	Other .....	11

House of Representatives		Senate
<b>Profession</b>		
215.....	Lawyer .....	63
81.....	Business Executive or Banker.....	15
45.....	Educator.....	6
14.....	Farmer or Rancher .....	6
22.....	Career Government Official.....	0
24.....	Journalist or Communications Executive .....	4
2.....	Physician.....	0
1.....	Veterinarian .....	1
0.....	Geologist .....	2
6.....	Worker or Skilled Tradesperson .....	0
25.....	Other .....	3
<b>Ethnic Group</b>		
17.....	Black American.....	1
2.....	Asian American.....	3
4.....	Hispanic American .....	0

GO ON TO THE NEXT PAGE.

21. In the Senate, if 25 male members were replaced by 25 female members, the ratio of male members to female members would be

- (A) 4 to 1
- (B) 3 to 1
- (C) 3 to 2
- (D) 2 to 1
- (E) 1 to 1

22. Approximately what percent of the members of Congress are lawyers?

- (A) 63%
- (B) 58%
- (C) 56%
- (D) 52%
- (E) 49%

23. If 5 senators are Catholic Democrats, how many senators are neither Catholic nor Democratic?

- (A) 79
- (B) 74
- (C) 69
- (D) 31
- (E) 21

24. If all lawyers and all women in the House of Representatives vote for the passage of a bill, how many more votes will be needed for a majority?

- (A) 435
- (B) 220
- (C) 3
- (D) 0
- (E) It cannot be determined from the information given.

25. Which of the following can be inferred from the information given in the chart?

- I. More than 80 percent of the men in Congress are members of the House of Representatives.
- II. The percent of members who are categorized as farmers or ranchers is greater for the House of Representatives than for the Senate.
- III. The median age in the Senate is 57.

- (A) I only
- (B) II only
- (C) III only
- (D) I and II
- (E) I and III

GO ON TO THE NEXT PAGE.

26. If  $xy \neq 0$ ,  $\frac{x-1}{xy} =$

- (A)  $\frac{1}{x} - \frac{1}{xy}$
- (B)  $\frac{x}{y} - \frac{1}{xy}$
- (C)  $\frac{1}{y} - x$
- (D)  $\frac{1}{y} - \frac{1}{xy}$
- (E)  $\frac{1}{xy} - \frac{1}{y}$

27. The number 0.01 is how many times as great as the number  $(0.0001)^2$ ?

- (A)  $10^2$
- (B)  $10^4$
- (C)  $10^6$
- (D)  $10^8$
- (E)  $10^{10}$

28. A certain cake recipe states that the cake should be baked in a pan 8 inches in diameter. If Jules wants to use the recipe to make a cake of the same depth but 12 inches in diameter, by what factor should he multiply the recipe ingredients?

- (A)  $2\frac{1}{2}$
- (B)  $2\frac{1}{4}$
- (C)  $1\frac{1}{2}$
- (D)  $1\frac{4}{9}$
- (E)  $1\frac{1}{3}$

29. If  $x > 0$  and  $y > 0$ , which of the following is

equivalent to  $\frac{x}{y}\sqrt{\frac{y}{x^2}}$ ?

- (A) 1
- (B)  $\frac{\sqrt{x}}{\sqrt{y}}$
- (C)  $\sqrt{x}$
- (D)  $\frac{1}{\sqrt{x}}$
- (E)  $\frac{1}{\sqrt{y}}$

30. The cost, in dollars, of manufacturing  $x$  refrigerators is  $9,000 + 400x$ . The amount received when selling these  $x$  refrigerators is  $500x$  dollars. What is the least number of refrigerators that must be manufactured and sold so that the amount received is at least equal to the manufacturing cost?

- (A) 10
- (B) 18
- (C) 45
- (D) 90
- (E) 100

# FOR GENERAL TEST 1 ONLY

Answer Key and Percentages\* of Examinees Answering Each Question Correctly

VERBAL ABILITY					
Section 1			Section 4		
Number	Answer	P+	Number	Answer	P+
1	A	90	1	A	84
2	B	82	2	E	86
3	B	81	3	B	87
4	E	77	4	C	80
5	D	70	5	A	74
6	C	62	6	B	71
7	C	28	7	C	68
8	C	96	8	C	98
9	C	85	9	D	76
10	C	46	10	C	70
11	A	46	11	B	63
12	A	46	12	B	80
13	A	39	13	B	48
14	E	36	14	B	48
15	E	35	15	D	26
16	A	26	16	D	35
17	C	63	17	D	58
18	B	63	18	D	97
19	A	64	19	B	89
20	C	75	20	D	51
21	E	64	21	B	66
22	D	46	22	B	33
23	D	51	23	A	48
24	B	62	24	C	74
25	A	59	25	D	70
26	E	52	26	A	51
27	E	66	27	A	48
28	E	69	28	E	69
29	A	66	29	E	67
30	E	76	30	E	69
31	B	78	31	E	58
32	C	41	32	E	30
33	C	37	33	C	44
34	C	36	34	A	25
35	C	35	35	E	31
36	A	29	36	D	36
37	A	18	37	D	25
38	D	21	38	E	19

QUANTITATIVE ABILITY					
Section 3			Section 7		
Number	Answer	P+	Number	Answer	P+
1	A	85	1	C	94
2	C	84	2	A	80
3	B	79	3	C	85
4	D	76	4	B	76
5	C	57	5	A	64
6	D	70	6	B	67
7	D	69	7	B	72
8	D	52	8	D	69
9	B	34	9	D	34
10	A	50	10	A	38
11	A	42	11	D	19
12	C	26	12	D	59
13	C	57	13	D	42
14	B	52	14	D	28
15	A	35	15	B	40
16	E	75	16	B	88
17	E	86	17	B	80
18	D	81	18	B	77
19	A	63	19	A	74
20	B	63	20	C	71
21	B	92	21	B	84
22	C	90	22	D	58
23	B	71	23	D	54
24	E	58	24	A	63
25	D	71	25	A	34
26	C	47	26	D	51
27	E	32	27	C	52
28	E	44	28	B	32
29	A	19	29	E	49
30	E	47	30	D	57

ANALYTICAL ABILITY					
Section 2			Section 6		
Number	Answer	P+	Number	Answer	P+
1	C	88	1	A	91
2	C	87	2	D	81
3	E	92	3	D	72
4	E	86	4	D	83
5	C	81	5	D	79
6	A	66	6	E	75
7	A	45	7	A	76
8	B	89	8	B	76
9	B	66	9	A	70
10	E	52	10	C	59
11	C	81	11	E	56
12	D	89	12	B	48
13	D	68	13	C	34
14	A	47	14	A	67
15	A	44	15	B	78
16	B	62	16	E	58
17	A	45	17	A	26
18	B	50	18	D	25
19	D	37	19	B	60
20	D	60	20	B	54
21	D	23	21	C	56
22	E	30	22	D	40
23	B	54	23	B	68
24	E	51	24	C	68
25	E	30	25	B	60

\*Estimated P+ for the group of examinees who took the GRE General Test in a recent three-year period.

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